

### REMARKS/ARGUMENTS

The claims are 2-19. Claims 17 and 19 have been amended to better define the invention. Applicant also herewith submits a Terminal Disclaimer and a Declaration under Rule 132. Reconsideration is expressly requested.

Claims 2, 3 and 5-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Rosenberg et al.* U.S. Patent No. 6,046,297 in view of *Sondhe et al.* U.S. Patent No. 5,340,652. The remaining claims 4 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Rosenberg et al.* and *Sondhe et al.* and further in view of *Motsinger et al.* U.S. Patent No. 3,217,536.

Essentially the Examiner's position was that *Rosenberg et al.* discloses the process recited in the claims, except for bringing the mixture into contact with a synthetic resin that is not cured or not completely cured, that *Sondhe et al.* discloses this feature, and that it would have been obvious to one of ordinary skill in the art to combine the composition of *Rosenberg et al.* with the process of *Sondhe et al.* motivated to do so for

such desirable properties as longer pour life, reduced tendency to crack, and reduced presence of toxic free toluene diisocyanate monomers, as evidenced by *Rosenberg et al.* *Motsinger et al.* was cited with respect to claims 4 and 19 as disclosing a reinforced synthetic resin that is part of a wind vane.

The Examiner reasserted her position that the order of mixing of *Rosenberg et al.* is immaterial because no order of the reactants was said to be recited in Applicant's claims and in any event the final product would be the same regardless of the order of mixing unless evidence to the contrary was provided. The Examiner also found Applicant's argument that the composition produced in *Rosenberg et al.* does not have the properties of the composition produced according to Applicant's process unpersuasive, because according to the Examiner these properties are not part of Applicant's claims. The Examiner asserted that *Rosenberg et al.* is analogous art to Applicant's process, that it is not important that *Sondhe et al.* does not teach aromatic amines because the Examiner is not relying on *Sondhe et al.* as disclosing the use of aromatic amines, and that it is not important that *Motsinger et al.* does not teach a wind vane of a

wind power plant because a wind power plant is not part of any of the claims.

This rejection is respectfully traversed.

As set forth in claim 17 as amended, Applicant's invention provides a process for the production of synthetic resin composite materials with flexible polyurethane gel coats. The process comprises the steps of mixing of a polyol component A) and a polyisocyanate component B). The polyol component A) contains

A1) one or several low molecular weight polyols with a molecular weight of 160 to 600 g/mol and a hydroxyl group concentration of 5 to less than 20 mol hydroxyl groups per kg of low molecular weight polyol,

A2) one or several higher molecular weight polyols with an average functionality of  $\geq 2$  and a hydroxyl group concentration of less than 5 mol hydroxyl groups per kg of higher molecular weight polyol and

A3) one or more light-resistant aromatic amines.

The polyisocyanate component B) contains one or several polyisocyanates.

The mixture is at least partially cured to form a gel coat material. The gel coat material is brought into contact with synthetic resin. The synthetic resin comprises epoxy resin and/or vinyl ester resin and is not, or not completely, cured at the time when it is brought into contact with the gel coat material.

In this manner, Applicant's process produces a component for a polyurethane-based gel coat resin system which provides a comparatively long lamination time with a pot life sufficient for mixing and for introduction into the mold, comparatively short gel and tack-free times that are nevertheless sufficient for film formation, good adhesion between gel coat and synthetic resin, a light and weathering resistant gel coat with no tendency to crazing, and creates a smooth component surface that is free from sink marks, and which is easily processable and inexpensive.

None of the references cited by the Examiner, whether alone or in combination, discloses or suggests the process for the production of synthetic resin composite materials with flexible polyurethane gel as recited in Applicant's claim 17 as amended.

The Examiner took the position in the Examiner's Response to Arguments, set forth on page 9 of the Office Action, that "the instant claims do not specify an order of mixing the components". Claim 17 as amended recites that a polyol component A) and a polyisocyanate component are mixed and the mixture at least partially cured to form a gel coat material. Because the polyol component A) is specified as containing A1), A2), and A3), these items must be mixed before they are mixed with the polyisocyanate component B). It is therefore respectfully submitted that claim 17 as amended recites an order of mixing compounds A1), A2), and A3) before any of those three compounds are mixed with component B).

It is respectfully submitted, moreover, that *Rosenberg et al.* fails to disclose or suggest mixing aromatic amines with polyols before mixing those polyols with polyisocyanates. Rather, *Rosenberg et al.* discloses that first polyisocyanate is mixed with polyols, next all or substantially all of the free

polyisocyanate is removed from the mixture (see claim 1, step (b)), and only thereafter are aromatic amines added to the mixture of polyol and polyisocyanate. All three claims of *Rosenberg et al.* include explicitly or implicitly the order of the introduction of aromatic amines to polyols that have already been mixed with and that have already reacted with polyisocyanates. *Rosenberg et al.* additionally discloses that the aromatic amine should not be pre-mixed with polyol before being added to the polyol/polyisocyanate mixture, because doing so significantly increases the propensity of the final mixture to crack and reduces the pot life of the final mixture. See column 3, lines 18-20 and column 11, lines 3-10 of *Rosenberg et al.*

It is respectfully submitted that one of ordinary skill in the art understands that altering the order of introduction of various reactants to a chemical reaction alters the final product of the chemical reaction. If a component A forms bonds with component B before component C is added, then different functional groups will be available to bond with component C than would be available if component C were introduced simultaneously with component B to component A.

This fundamental concept of chemistry of the significance of the order of introduction of the reactants is highlighted in the process disclosed in *Rosenberg et al.* In *Rosenberg et al.*, aromatic amine is intended to be reacted only with a polyurethane that has been produced by mixing polyol and polyisocyanate so that the polyol and polyisocyanate have chemically bonded. Polyisocyanate is added in molar excess in comparison to the polyol, so that all of the polyol will react with polyisocyanate. See step (a) of claim 1 of *Rosenberg et al.* All or substantially all of the free polyisocyanate is thereafter removed from the mixture, so that the mixture contains no or substantially no free polyisocyanate. There is also no or substantially no free polyol because of the molar excess of polyisocyanate introduced in step (a). See step (b) of claim 1 of *Rosenberg et al.* Aromatic amine is added only thereafter. See step (c) of claim 1 of *Rosenberg et al.*

In contrast, with Applicant's process as recited in claim 17 as amended, aromatic amine is intended to react with polyol that has not yet bonded with polyisocyanate. At the time aromatic amine is mixed with the polyol in Applicant's process as recited in claim 17 as amended, no polyisocyanate has been introduced to the mixture. As recited in Applicant's claim 17 as amended,

polyisocyanate component B) is mixed with polyol component A), and in the polyol component A) polyols and aromatic amines have already mixed and reacted with each other.

The chemical reaction of *Rosenberg et al.* is different from the chemical reaction of the process recited in Applicant's claim 17, as amended, and therefore produces a product of a different type than is produced by the chemical reaction of the process recited in Applicant's invention as recited in claim 17 as amended.

Applicant's invention as recited in claim 17 as amended relates to the production of synthetic resin composite materials with gel coats. The requirements of gel coats for such composite materials are very specific and are set out at pages 1-5 of Applicant's disclosure. For example, there must be adequate **adhesion** between synthetic resin and gel coat, which in turn requires that the curing of the mixture so as to form a gel coat material must proceed in a very specific manner. In particular, after the initial curing of the gel coat mixture, the subsequent **lamination time** during which the mixture must be sufficiently tacky needs to be long enough so as to allow the processing and



preparation of a composite with good adhesion of the synthetic resin.

Such specific properties do not need to be shown by **castable** polyurethanes, and *Rosenberg et al.* relates to the production of **castable** polyurethane compositions. See *Rosenberg et al.* at column 1, lines 10-11. The castable polyurethanes of *Rosenberg et al.* may be used for industrial rolls such as papermill rolls, industrial wheels and industrial tires. See *Rosenberg et al.* at column 3, lines 32-34.

**Castable** polyurethane compositions are typically formed by being poured into a mold. Properties such as adhesion, lamination time, and tack-free time, which are important for a coating material such as the gel coat material produced in step (i) of Applicant's process as recited in claim 17 as amended, are largely irrelevant for castable polyurethanes, such as the articles produced in *Rosenberg et al.* A molded product often has no need for quality adhesion to the mold, as the product will subsequently be removed from the mold so that more material can be poured into the mold for molding. In contrast, Applicant's invention depends on a prolonged lamination time for the gel coat

in order to achieve good adhesion to the synthetic resin of the composite material.

The defects and deficiencies of the primary reference to *Rosenberg et al.* are nowhere remedied by the secondary references to *Sondhe et al.* and *Motsinger et al.*

*Sondhe et al.* fails to disclose or suggest mixing an aromatic amine with polyol before the introduction of polyisocyanate to the polyol. Rather, *Sondhe et al.* discloses that aromatic amine, the epoxy hardener, is added to polyurethane. Polyurethane is a combination of polyol and polyisocyanate. Therefore, the coating of *Sondhe et al.* is chemically different from the gel coating material produced in step (i) of the process of Applicant's claim 17, as amended, and has different properties from the gel coating material produced in step (i) of the process of Applicant's claim 17, as amended, because in *Sondhe et al.* aromatic amine is added to the reaction mixture only after polyol and polyisocyanate have already reacted.

*Motsinger et al.* fails to disclose or suggest any mixing of aromatic amines, polyols, and polyisocyanates. *Motsinger et al.*

fails to disclose or suggest the mixing of any specific chemical components to form a product.

It is also respectfully submitted that even if the process disclosed in *Rosenberg et al.* were considered to disclose step (i) of Applicant's process as recited in claim 17 as amended, which it does not, one of ordinary skill in the art would receive no hint or suggestion from *Rosenberg et al.* to attempt to use the component produced by the method of *Rosenberg et al.* as a gel coat material with a synthetic resin on a composite material. *Rosenberg et al.* is directed exclusively to the production of castable polyurethanes. Castable polyurethanes do not have need of the qualities, such as those described above, that are important for a gel coat. Therefore one of ordinary skill in the art would not be led by the disclosure of *Rosenberg et al.* to combine or to attempt to combine the composition of *Rosenberg et al.* with the epoxy resin of *Sondhe et al.*

Additionally, in response to the Examiner's assertion on page 9 of the April 9, 2009 Office Action that factual evidence has not been provided by Applicant that following the method of *Rosenberg et al.* does not produce a gel coat material as recited in Applicant's claim 17 as amended, Applicant herewith submits a

Declaration under Rule 132 by Dr. Jochen Wehner, the inventor herein and a person skilled in the art of composite materials and coatings for composite materials. As detailed in his Rule 132 Declaration, Dr. Jochen Wehner explains that following the method of *Rosenberg et al.* does not produce a gel coat material as recited in Applicant's claim 17 as amended.

Accordingly, Applicant respectfully submits that claim 17 as amended is patentable over the cited references, taken either singly or in combination, together with claims 2-16, which depend directly or indirectly thereon. Applicant also respectfully submits that claim 18 for a synthetic resin composite material with flexible polyurethane gel coat, producible by the process according to claim 17 is patentable over the cited references taken either singly or in combination. Applicant also respectfully submits that claim 19 for a rotor vane for a wind power plant or a part thereof, that is a composite material according to claim 18, is also patentable over the cited references taken either singly or in combination.

Claim 4 is dependent on claim 17 and further specifies that the synthetic resin used comprises one or several reinforcing materials, wherein glass fiber fabric and/or glass fiber nonwoven

and plastic fiber fabric or carbon fiber bonded fabric are used as reinforcing material.

In this manner, Applicant's process as recited in claim 4 produces a composite material with improved capabilities of being resistant to weathering.

None of the references cited by the Examiner, whether alone or in combination, discloses or suggests the process for the production of synthetic resin composite materials with flexible polyurethane gel, wherein the synthetic resin comprises one or several reinforcing materials, as recited in Applicant's claim 4.

*Rosenberg et al.* and *Sondhe et al.* both fail to disclose the use of reinforcing materials with a synthetic resin. *Rosenberg et al.* fails to disclose the use of a synthetic resin. *Sondhe et al.* fails to disclose the use of any reinforcing material with the synthetic resin. *Motsinger et al.* fails to disclose any mixing of aromatic amine with a polyurethane.

It is therefore respectfully submitted that claim 4 is patentable over the cited prior art references, whether taken singly or in combination, for this additional reason.

Claim 19 has been amended to specify that the composite material is a rotor vane for a wind power plant or a part thereof. It is respectfully submitted that *Motsinger et al.* fails to disclose or suggest a rotor vane for a wind power plant. Rather, *Motsinger et al.* discloses a force vector transducer for measuring the force and direction of a body of fluid, with a fixed outer shell. Therefore, as described in Applicant's January 29, 2009 Amendment, the transducer of *Motsinger et al.* will be impacted only during high wind velocities during a storm. In contrast, with Applicant's composite material that is a rotor vane for a wind power plant or a part thereof, the rotor vane will move even at slow wind velocities and is impacted by the wind in a perpendicular direction to the flow of the wind, and thus requires greater durability to withstand the greater mechanical and abrasive long term stress it will receive.

It is therefore respectfully submitted that claim 19 as amended is patentable over the cited prior art references for this additional reason.

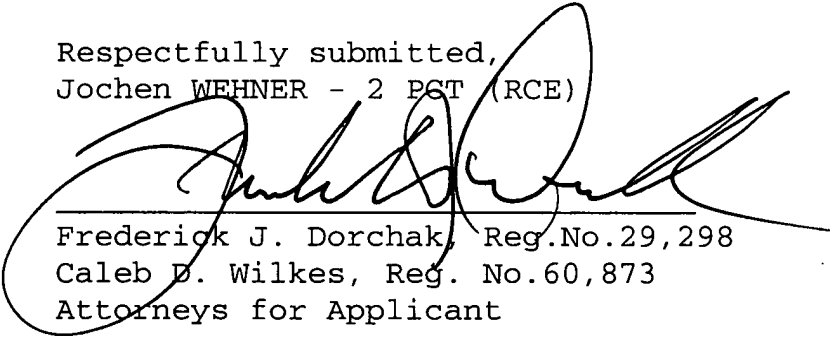
Accordingly, it is respectfully submitted that the claims are patentable over the cited references whether considered alone or in combination.

Claims 10-17 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 7 and 12-17 of copending, commonly-owned U.S. Patent Application No. 10/572,784. In response Applicant herewith submits a Terminal Disclaimer with respect to U.S. Patent Application No. 10/572,784, thereby obviating the double patenting rejection.

In summary, claims 17 and 19 have been amended. In addition, a Terminal Disclaimer and a check in the amount of \$140.00 in payment of the Terminal Disclaimer fee are enclosed. In view of the foregoing, it is respectfully requested that the claims be allowed and that this case be passed to issue.

Respectfully submitted,  
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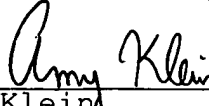


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Enclosures:

Copy of Petition for a three-month Extension of Time  
Rule 132 Declaration  
Terminal Disclaimer with a check in the amount of \$140.00

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on October 9, 2009.



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